United States
Naval Postgraduate School

TERM PROJECT REPORT

SYSTEMS ACQUISITION MANAGEMENT

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INTRODUCTION

This report deals with a term project in Washington, D.C. that was undertaken to gather information for use in further developing the Systems Acquisition Management (SAM) Curriculum at the Naval Postgraduate School. This was to be accomplished by observation of actual project office operations.

The objective of the eighteen month Systems Acquisition Management Curriculum (816), which leads to a Master of Science Degree in Management, is "to provide selected officers with an advance education in the fundamental concepts, methodology, and analytical techniques for the life cycle management of the planning and acquisition of defense systems." Curriculum design is specifically oriented to stress the system life cycle, "real world" environment, and integration of all of the individual techniques of decision making and problem solving.

This emphasis, of directly relating the curriculum to meet the needs of the officers once assigned to projects, suggested a requirement for both observing project office operations and soliciting ideas and recommendations from project managers themselves.

Observing project operations through discussions with people, attending meetings, etc. would be a means for helping determine the primary areas of concern, defining problems, finding how projects are organized to accomplish their objectives, establishing what management methods and styles are used, and seeing how the project organizations interact with others. Previous contact with several Project Managers

confirmed that they would assist in any way possible to provide such information.

An invitation had been extended by the Naval Logistics Management School (NLMS), Washington, D. C., for me to attend the two week Weapon System Acquistion Management Baseline Course, commencing 27 September. This would provide an introduction to the current Washington project environment, and facilitate my meeting managers from the project and functional organizations.

During the period 27 September through 3 December 1971, I attended the NLMS Baseline Course and visited numerous project and project-related functional organizations. In those cases where people were unfamiliar with the NPS SAM Curriculum, I advised them of the objectives and outlined the types of courses that were being offered. In addition to discussing the operations of these organizations, I solicited ideas concerning their reaction to having officer students being assigned to project offices for experience tours, and requested any documentation, i.e. reports, instructions, etc., that could be provided for use in the SAM courses.

The following sections will summarize my experiences at the NLMS Baseline Course and visits to project and functional organizations. In format, each section will contain a background description brief and comments concerning my experiences with that individual organization.

What I have attempted to accomplish is providing a general overview of my visits, by identifying which organizations were visited, what the organization does, brief comments on the organization and staffing,

what I did while in contact with the organization and what types of documentation would be available (where appropriate). These summaries do not cover the specifics of all topics discussed, due to the classification or sensitivity of information.

The final sections contain comments and observations concerning the general project environment, and provide conclusions and recommendations. Appendix A lists the NLMS Baseline Course attendees and Appendix B identifies the names of people that were contacted in the various organizations.

WEAPON SYSTEM ACQUISITION MANAGEMENT BASELINE COURSE

Background Information:

The Weapon System Acquisition Management Baseline Course was established at the Navy Logistics Management School, Naval Station, Washington, D.C. and offered for the first time in February 1971.

Indoctrination of Project Managers, OPNAV Program Sponsors, their deputies and other selected senior military and civilian personnel in the latest philosophy, policies and practices relating to project management is the primary purpose of this course. It is scheduled four times per year, and is designed to accomodate six to fifteen students per class. The course length is ten days, and lectures, seminars and review of cases are employed as methods of instruction. Instructors are senior military and civilian personnel from the Navy Department, Department of Defense, General Accounting Office, Etc., who have current operating experience in the areas being covered in the course.

Course Format:

The course is divided roughly into twenty-six different areas. The areas and major topics are outlined and briefly summarized below:

Navy Project Management Philosophy - current philosophy, policies and directives being emphasized today.

National Economic Projections - familiarization with current and expected future economic trends and their effect on project management.

Defense Systems Acquisition Cycle - explanation of the phases of acquisition, i.e. ACP, DCP, SAR, DSARC, and other life cycle elements.

Relationship & Responsibilities in the Program Sponsorship/ Project Management Process - discussion of the roles and interfaces between the OPNAV Program Sponsors, Program Coordinators, Appropriation Sponsors and the Project Managers.

User-Producer Dialogue - emphasizes general dialogue and interfaces between the Chief of Naval Operations, Fleet, Chief of Naval Material and activities in the Naval Material Command in the acquisition process.

OPNAV Program Coordinator Views - presentation by a major Porgram Coordinator concerning a specific program modus operandus.

Planning & Its Many Elements - discussion of planning requirements, from the DOD/NAVMAT point of view.

Programming & Budgeting - explanation and discussion of the Programming and Budgeting Cycle, as it applies to project management.

Five Year Defense Program Review - FYDP, POMs, PDMs, budget submissions, reprogramming, etc.

Justification of Budget Estimates - requirements, timing, pricing, obligation vs expenditure, appropriations, etc.

Execution of the Budget Cycle - funds flow and distribution, account structures, financial data, reporting, organizational relationships.

Role of the Systems Command Comptroller - presentation by two comptrollers concerning financial responsibilities of Project Managers and their interaction with the comptroller organizations.

Life Cycle Costing (LCC)- introduction to policy, procedures and implementation of LCC concepts.

Testing & Evaluation - brief overview of Operational Test and Evaluation (OT&E) today and future emphasis.

Data Management - management of project data and reporting systems.

Satefy - new emphasis on system safety engineering and its relationship to project management.

Performance Measurement - introduction into the contractor management control systems required by DOD Instruction 7000.1.

Cost Aspects of Weapon System Acquisition - explanation of current cost estimating techniques, their reliability and use in actual practice.

Procurement & Contract Administration - applications relating to the acquisition of weapons systems.

Development Contracts - general background information and discussion of operating procedures.

Proposal Evaluation & Source Selection - review of the requirements in developing a Request for Proposal, then evaluating and selecting a contractor.

Legal Aspects of Contract Administration - emphasizes the evaluation and control of constructive changes, change control techniques, claims, etc.

Field Contract Administration - mission and scope of field contract administration responsibilities and their impact on project management.

Configuration Management - discussion of concepts and techniques, and the relationship to project acquisition planning.

Integrated Logistic Support (ILS) - discussion of life cycle support, relating ILS to the other management disciplines.

Task Planning & Evaluation Techniques - actual experiences in establishing successful management review and control techniques in an actual project.

Organization in Support of Project Managers - review of recent studies concerning the top-level Navy Department organization and its relationship to Project Managers.

Personnel Staffing - current trends in civilian and military manpower management.

The General Accounting Office - defines the role of GAO in the acquisition process and the Navy/GAO relationships.

Congressional Liaison - defines the role of witnesses appearing before Congressional Committees, methods of preparation for and presentation during hearings, and previous experiences by Navy Project Managers in testifying.

Case Studies - illustrative cases presented by individual Project Managers.

Acquisition of a Major Weapon System - every-day operations, problem solving and decision making.

Project Organization - organizing and staffing a major project which is designated both a CNM and Systems Command Project.

Theory vs. Reality - question and answer period chaired by a Project Manager.

DSARC Realities - preparation for and presentation to the Defense Systems Acquisition Review Council.

Review Periods - allocated for review and discussion of topics previously presented.

Seminar & Concluding Exercises - address by a guest speaker and presentation of certificates to course graduates.

Method of Presentation:

During the two-week period, over forty speakers participated. A two-volume course notebook was provided to each student, which contained a complete course outline, handout material and references for each topic presented. In this manner the students were able to know what was being presented and read through the background reference material in advance. This served to help keep the wide range of topics being discussed in their proper perspective, and precipitated much more meaningful student discussion with the speakers.

The oral review periods during the course and a written critique, submitted just prior to course completion, provided each student with the opportunity to express his thoughts about the content of the course itself and the effectiveness of the individual speakers. From this information the NLMS staff updates or changes the material provided during future courses and speakers can reevaluate their presentations in light of student comments. Comments are then reviewed by NAVMAT headquarters management personnel to assure that students are receiving the correct material, presented in a proper fashion.

Summary:

Since the Navy Logistics Management School has provided the Naval Postgraduate School with complete course documentation, this section will summarize major thoughts, ideas and events covered by the speakers themselves, either individually or collectively.

The Laird/Packard Philosophy, stated in a formal sense, stresses "participatory decision-making," "defined decentralization," "and delegation under guidance." This philosophy, expressed through a people oriented management style, is characterized by a scaling down of resources without hindering our ability to meet constantly changing threats to national security.

Deputy Secretary of Defense David Packard has stated that innovative urgency is required at all echelons and that the OSD will assume a greater policy making vice operational role. He views the individual services and agencies assuming more of the implementation role and the present OSD organization reducing in size.

Several thoughts that have been emphasized by Mr. Packard, in reference to the management area, include: (1) management in the Services will be improved only to the extent that capable people are designated to manage the programs; (2) program managers must be given adequate authority to make decisions on major questions relating to their programs; (3) program managers must be given more recognition toward career advancement; (4) program managers must be assigned to a given program long enough to be effective; and (5) the layering of authority between the program manager and the Service Secretary must be minimized by changing the

present management techniques. More concisely stated "put more capable people into program management, give them the responsibility and authority and keep them there long enough to get the job done right." /1

The requiremnt for URGENCY has been restated and reemphasized on many occasions. For example, Director of Defense Research and Engineering Dr. John S. Foster, Jr., in a speech early in 1971, assessed the relative positions of technology between the United States and the Solviet Union. At that time, we held the lead; the USSR was gaining at a rate of 3 to 4 months per year; they would either equal or exceed our capability in the 1975-1980 time frame; and without change in our present way of doing business we may not be able to catch up. Then in a speech during the fall of 1971, he suggested that the Soviets will surpass us in technical superiority.

The complexity of the weapons system acquisition process in recognized by DDR&E, due to changes in threat, technology and national priorities, as well as inflation, highly interdependent weapons systems components and the inherent risks in research and development. They categorize the major factors contributing to cost, schedule and performance problems as (1) failure to get a good program to start with due to: inadequate definition of requirements, insufficient hardware demonstration, unreliability of cost estimating, funding insufficiency, premature commitment to system development, optomistic/concurrent schedules,

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/1 DEPSECDEF Memo of 5/28/70, Policy Guidance on Major Weapon System Acquisition

and insufficient identification and reduction of risk, or: (2) failure to manage the program properly after it starts because of: overcentralization of military departments and OSD, funding inefficiency and variations, excessive technical documentation, too many and too detailed management systems, reliance on management systems vice people, lack of sufficient high quality managers, inflexibility of contracting methods, and premature commitments considering the risks involved.

OSD visualizes the DOD actions necessary to relieve problems at program start to include: DCPs and Program Memoranda, DSARCs, formal risk analyses using outside sources of evaluation, management reviews, more thorough concept formulation, budgeting to "best estimate," cost realism, prototyping as a means of resolving uncertainty, emphasis on simplicity and reduction of performance requirements, reduction of concurrency, and not allowing overdesign.

In order to relieve problems after program start, DOD actions include: milestone concept, establishment of DCP thresholds, clarification of OSD and service roles, reduction in overhead (excess number of reviews and data requirements, decision layering, etc.), flexible contracting, upgrading of program managers, control of engineering changes, holding to a funding profile, and SARs.

Prototyping is viewed by Dr. Foster as a means of obtaining more options in decision making. He feels that the way we are going today we will lose our capability for creativity in industry, therefore we must develop independent solutions to solve operational problems, instead of the military attempting to define the problem, developing

detailed specifications, then getting industry to bid on building the systems.

The previous paragraphs outline the major problems and solutions as seen by OSD. I would now like to discuss several aspects of these problems from personal observation, that are not addressed in the recommended solutions.

I have found no basic disagreement with the Laird/Packard philosophy or with the emphasis on urgency by both Mr. Packard and Dr. Foster. However, layering, concurrency and resolving uncertainty through prototyping are among those areas that merit further discussion.

Layering in decision making has been recognized as a traditional problem in the military services. The current policy of identifying Project Managers by name and delineating their authority and responsibilities in the Project Charters has given a degree of visibility to these billets. This has enabled higher authority, i.e. officials of the Executive and Congressional Branches, OSD, OSN, OPNAV, NAVMAT, etc. to communicate directly with a PM concerning his project, however, the reverse chain of cummunications, even in answering inquiries from these sources, is quite different. The following considerations may serve to illustrate this problem: WHO (person or organization):

(1) is asking the question, requesting a decision, or impacted by a decision?

(2) has control of the funds, or seniority in the situation?

(3) needs (or wants) to be kept advised, or consulted?

(4) are those that support (or oppose) you in this situation?

WHAT

(1) is the question, decision to be made, or the impact of a decision on other persons or organizations?

(2) are the political, economic or social considerations, or the budgetary, operational or technical implications?

WHEN (in reference to time):

(1) should or can a decision be made, or decision rendered?

(2) or how in the past has a similar situation been addressed?

HOW (in reference to method of communication):

(1) should or can a decision be expressed or inquiry answered?

The amount of layering in the decision process can be affected by the above considerations, and the answer to this problem has not been found to date, even though all echelons of management agree that the problem does exist. Successful PMs have been able to partially reconcile the problem through their own individual resourcefulness in dealing with situations as they occur, but at best the situation is still unsatisfactory.

Concurrency and resolving uncertainty through prototyping can be discussed together. The problem arises when the decision is made to commence production of a system prior to completion of engineering development or prior to adequate test and evaluation of the system. In the past, some instances have occurred where it was felt that the need for a system was so urgent that it had to be made available to the operating forces at the earliest possible date. Decisions were made to proceed with production, even though all of the design and engineering problems had not been solved. Over optimism as to the ability to resolve these

problems resulted in either introducing a system to the forces that did not have the intended capability, or continued delay and resultant cost growth beyond the original intentions. The results of these past errors have been well publicized by our critics.

We can see a shift toward prototyping in NAVSHIPS through the new Patrol Frigate (PF) Program, in which an industry/Navy team effort will go into the detailed design and engineering effort, and a lead ship will be built. At a later point in time, separate contracts are to be awarded for construction of groups of these ships. This is a quite different approach than that used for the DD 963 Program, where one contractor is developing, engineering and producing a whole program's worth of ships.

Will this concept work for weapons systems under development that will eventually be allocated to and installed aboard these same ships and others now in the active fleet? If a given weapons system has broad or universal application, which is intended to meet a threat which exists today, do we have time for prototyping? Or, should be build and test multiple units simultaneously?

The answers to these questions will not be resolved through flexible interpretation of the concurrency and prototyping policy. If the urgency of a program is such that the Project Manger has universal support, including the allocation of budget dollars, the problem will tend to disappear. If the program is inadequately funded, regardless of urgency, the problem will still exist. How the Project (or Program) Managers trade-off the risks involved in building and delivering

multiple units with the delays involved in prototyping is still undetermined.

The lack of budget dollars to support program objectives was expressed as a major problem both during the course and later by Project Managers. One PM pointed out in his presentation that "time is money." Compressing a schedule to get earlier delivery will cost more and stretching out delivery over a longer time frame will also cost more. This budgetary dilemma becomes progressively more vivid when facts are presented, such as "steel prices alone will cause us to exceed our budget predictions by $250 million in fiscal year 1973" and "people costs are now 50% of the total budget and are estimated to go to at least 64% within two years, and possibly to 68%."

Cutting down on expenses through personnel reductions-in-force has become a way of life. Personnel losses at the headquarters level are even more acute for Navy than the other services. This is caused by the disproportionate percentage of lower than command level echelons in the metropolitan Washington, D.C. area. With adequate personnel not being available to properly staff the existing project offices now, some officials feel that the only solution will be vertical cuts, which will mean elimination of some of the projects.

Because of the downtrend in availability of budget dollars, cost estimating has become on the the most critical problem areas in acquisition management, and is considered by some to be the most difficult to handle. Although dollar cost is a common denominator, regardless of the size or scope of the program, type of contract, priority of need, etc., it presents unique problems when projected into the economic uncertainties of future time periods.

Accurate cost estimates are required for three primary purposes during the acquisition process: first, in deciding whether or not to initiate a program; second, in order to authorize and allocate budget dollars; and third, in contract pricing. Credibility in cost estimating has been historically low, because of our inability to determine the final configuration of the system during the early stages of development and properly predict the effects of economic and technological change that will occur in time.

ANTI-AIR WARFARE (AAW) SHIP ACQUISITION PROJECT

Background Information:

The Anti-Warfare (AAW) Ship Acquisition Project (PMS 378) was established by the Naval Ship Systems Command on 1 February 1967 and formally chartered 1 November 1967. The organization evolved from Code 400G, established in August 1962 as the Surface Missile Systems (SMS) Coordinator, and redesignated Code 521 AAW Ship Branch in April 1966.

Management control responsibilities for both building and modernization extend to eight basic types of AAW ships: cruisers of the CLG, CG and CGN classes, destroyers of the DDG, DLG, and DLGN classes, LFS and AVM. These ships contain highly sophisticated missile, radar, communications and weapon-direction equipments.

The Project Manager, due to the need for a continuing liaision with the Naval Ordnance Systems Command for SMS systems, is also a member of the Surface Missile Systems (SMS) Project staff.

PMS 378 uses a matrix organization. One ordinate of the matrix is oriented to ship type, and presently consists of Assistant Project Managers (and staffs) for DLGN 36 Class, DLG Modernizations, and DLGN 38 Class. The other ordinate is composed of groups that are concerned with systems, subsystems, and components which go into the ships. These include a Ship System Management Division, Integrated Logistics Support Division and Government Furnished Equipment (GFE)/Government Furnished Information (GFI) Manager. The Plans, Programs and Financial Management Division provides additional staff support.

The project staff consists of seven military officers and approximately fifty eight civilian personnel. There is a military Project Manager (CAPT/1400), civilian Deputy Project Manager (GS 15) and APM staffs that total four military and twenty civilians. The Ships Systems Management, ILS and GFE/GFI Divisions total two military and twenty one civilians, and the Plans, Programs and Financial Management Divisions has six civilians.

Visit Summary:

My interest in observing PMS 378 operations carries over from my last two tours of duty (Philadelphia Naval Shipyard - one of two shipyards participating in the AAW Modernization Programs; USS STERETT (DLG 31) DLG 26 Class new construction program). Both of these tours contributed to a continuing relationship with this project organization.

Since this experience was oriented to a Naval shipyard/ship relationship with the project office, I was primarily interested in finding information concerning the contractor/SUPSHIP side of project operations. The Project Manager and Deputy were greatly interested in the NPS SAM Curriculum and invited me to spend as much time as I desired in visiting their project office.

A Quarterly Production Progress Conference was held at Newport News, Virginia on 20 and 21 October for the DLGN36 and DLGN38. The PMS 378 staff presented the government portion of the conference and Newport News Shipbuilding and Drydock Company conducted the contractor portion. The agenda was prepared well in advance, so the project office, contractor and SUPSHIP attendees were prepared to address the items of mutual interest

and concern. Agenda items included: Design Progress and Problems, Material, Contractor Modification Status, Construction Progress, PERT, Master Erection Schedule, Provisioning Technical Documentation, Technical Manuals and Combat Systems Test Program. I attended the conference, received a copy of the Conference Report, and toured the DLGN 36 and 37 construction sites with the conference attendees.

During the course of my visit I met with the DLGN Project Officer and his deputy. A summary of the meeting is covered in the section of this report entitled Supervisor of Shipbuilding, Conversion and Repair, Newport News.

Since the APM and contract staff for the DLGN 38 were applying full time efforts to the negotiation of a new contract with Newport News Shipbuilding and Drydock Company, I was unable to discuss this part of project operations with the staff during the course of my visit. Information concerning the contract will be available after the negotiations have been completed.

The PMS 378 staff provided a great deal of documentation pertaining to project management within the Naval Ship Systems Command, and assisted in obtaining information from other codes. This information will be summarized separately and turned over to the SAM Library.

ANTI-SUBMARINE WARFARE (ASW) SHIP ACQUISITION PROJECT

Background Information:

The Anti-Submarine Warfare (ASW) Ship Acquisiton Project (PMS 380) was established by the Naval Ship Systems Command on 1 February 1967. The programs allocated to this office included Destroyers (DDs), Ocean Escorts (Es) and Guided Missile Ocean Escorts (DEGs), all of which are designed to operate offensively against submarines and to screen support forces and convoys, in addition to contingent tasks.

One of the programs managed by PMS 380 is the DD 931/945 Class ASW Modernization Program.

Visit Summary:

My interest in visiting this office resulted from working with the PMS 380 staff in the past. The ASW Modernization Program started with eight DD-931/945 Class ships being programmed for overhaul and modernization at the Charleston and Boston Naval Shipyards. Long lead time material was ordered, however the whole program had to be deferred due to higher priority commitments in Southeast Asia.

Later the decision was made to conduct the modernizations at Bath, Maine in a private shipyard. Even though more long lead time material had been ordered, high costs caused the program to again be deferred. Finally the decision was made to have the Philadelphia Naval Shipyard handle the program, and again more material was ordered.

In early 1969, due to the workload at the Philadelphia Naval Shipyard being too heavy to complete the ships within the programmed time frame, the decision was made to reallocate two ships to Boston

Naval Shipyard, two to Long Beach Naval Shipyard, let three remain at Philadelphia and drop one completely (due to high costs). While the start/stop decisions were being made, the individual ships originally shceduled for the program were continuously changed as time went on.

This series of events is indicative of several aspects of uncertainty in project management. These are scheduling uncertainties, caused by redefinition of priorities and funding constraints, and secondly the uncertainty of not knowing if the program will be completed at all, due to the same factors. Project Managers and their staffs must make plans and preparations to start work within given time frames, according to predetermined schedules. Then if changes occur, such as those described above which were for the most part entirely beyond the control of the project staff, they must then assume the responsibility for reconstructing plans to coincide with the new constraints. This indeed results in a trememdous replanning and coordination burden for the Project Manager and his staff.

AUXILIARY AND AMPHIBIOUS SHIP ACQUISITION PROJECT

Background Information:

The Auxiliary and Amphibious Ship Acquisition Project (PMS 383) is being chartered by the Naval Ship Systems Command. /1 Originally auxiliary ships were managed by the Auxiliary Ship Acquisition Project (PMS 383) and amphibious ships and boats were under the cognizance of the Landing Ships, Boats and Amphibious Ship Acquisition Project (PMS 384). On 30 August 1971, PMS 384 ship acquisition responsibilities were transferred to PMS 383 and boat responsibilities were transferred to the Combat Craft Acquisition Project (PMS 300). At this point PMS 384 was disestablished.

This project is considered a conglomerate, in that a widely diversified number of different types of ships come under the cognizance of one SHAPM. The types of ships managed by PMS 383 include: AE, AFS, AO AOE, AOR, AD, AS, AR, AS (FBM), T-AK(FBM), LCC, LKA, FDL, AH, ARC, LPD, LSD, and BDL.

The project staff consists of six military officers and approximately forty eight civilians. There is a military Project Manager (CAPT/1400), civilian deputy (GS-15) and four Assistant Project Managers (Tenders; Amphibious, Research and Special Mission Ships, UNREP Wet Cargo; UNREP Dry Cargo). Two functional divisions support the AMP staffs (Ship System Management & Support Division; Plans and Programs Division).

/1 During December 1971 the most recent charter had not yet been published and distributed.

Visit Summary:

PMS 383 manages the acquisition of a wider range of ship types than any other SHAPM in NAVSHIPS. The management orientation of this project is quite different from many of the others, in that almost all of the ships are in the production phase, or have been delivered and are in the warranty period. This requires the project staff to deal not only with contractor, SUPSHIP and headquarters personnel, but the individual ships commissioning crews. Problems that were known but not corrected during production, as well as a whole host of new problems will surface rapidly during this period of time.

The project workload is summarized as follows:

As of 1 September 1971, there were 33 ships in the production and post production stages (20 had been delivered, 3 were scheduled for delivery during the remainder of 1971 and 10 were scheduled for delivery in 1972). Of the 13 undelivered ships, 6 LSTs were under construction at National Steel, San Diego, California, 2 LSDs and 2 AORs at General Dynamics, Quincy, Massachusetts, and 3 AEs at Ingalls, Pascagoula, Mississippi.

During the 10-month period from September 1971 through June 1972, 35 separate ships trials have been scheduled (Builders, Acceptance, and Final Contract Trials). They range in number from 2 to 5 per month. Each of the individual trials require extensive review and analysis effort by the project staff, and

many require project personnel on site during the actual trials. Additionally, an AOR and 2 ASs have been authorized in the Fiscal Year 1972 Shipbuilding Program. At this point in time the contracts had not yet been issued.

The management staff is confronted with many problems that arise from a workload of this magnitude and diversity, especially considering that the present organization has been in existence less than six months. Most projects work with one contractor and SUPSHIP organization, or at most a few, whereas PMS 383 deals with six contractor and SUPSHIPS organizations and one Naval Shipyard, as shown below:

SHIPBUILDER	SUPSHIP LOC.	SHIP TYPE	NR OF SHIPS
BETH STEEL	BAL., MD.	AE	2
INGALLS	PASC., MISS.	AE	4
NAT. STEEL	SAN DIEGO, CA.	AFS	1
		LST	11
GEN DYNAMICS	QUINCY, MASS.	AOR	4
		AS	2
		LSD	4
NNSDD CO.	NEW. NEWS, VA.	LCC	1
LOCKHEED	SEATTLE, WASH.	LPD	3
PHILA NSY	PHILA, PA.	LCC	1

Discussions with the project staff highlighted specific problem areas that can be addressed by the NPS SAM Curriculum. These include Data Management, Configuration Management and Management of Cost and Feasibility Studies.

Data Management

The basic unit being managed is the individual ship. Data inputs covering the ships are being made from the construction site (contractor and SUPSHIP), the ship itself after delivery, TYCOM staffs, OPNAV, other project and functional codes within NAVSHIPS and other Systems Commands, etc. For example, during Acceptance and Final Contract Trials hundreds of discrepancies are recorded for each ship, and each Trial Item must be monitored by the project staff. The receipt, processing, evaluation and reporting of this data is accomplished by individual people and not through use of a computer-based system. The volume of work in this area challenges the expertise of all engaged in this effort.

Configuration Management

Time becomes an important factor in configuration control, in addition to the problems created by ships of the same class being constructed by more than one shipbuilder. Ships being managed by PMS 383 date back to the FY 1965 Shipbuilding Program. Although mission assignment for the ships remains relatively constant, from time of authorization until final completion, changes in crew size, habitability and safety requirements, equipments, etc., create many configuration control problems. For example, policy changes such as crews being authorized to carry civilian clothing aboard ship or a new enlisted uniform will cause additional locker requirements. Berthing compartments may have to be rearranged or even completely redesigned to meet these new standards. How to program changes such as these, considering both funding and space constraints, becomes more than a minor problem.

Another type of configuration control problem was discussed. Ideally, all ships of a class should have identical equipments. Shipbuilders in different parts of the country use different subcontractors and vendors. Since ships are built to specifications and not to specific equipment manufacturer's components, there is a definite lack of standardization between shipbuilders. There is even a lack of standardization among ships produced by the same builder over a period of time, due to changes in contractors providing the government furnished equipment (GFE). This situation creates many problems for the Project Manager's staff, and they carry over to the fleet afterwards. For example, 17 of the 20 ship LST program were allocated to National Steel in San Diego, and 3, including the lead ship of the class, to the Philadelphia Naval Shipyard. At one point in time the stern winch assembly on a PNSY built LST had a major casualty, and it was located on the West coast. The first solution proposed was to install a whole new winch assembly, which could easily be provided by National Steel. However, since the winches were made by different manufacturers, not only the individual components were unlike, but the foundations to mount the equipment were completely different. Individual components were cannabalized from a PNSY LST under construction to solve the immediate problem. However, several days were lost in its resolve, due to these differences in configuration between the ships.

Management of Cost and Feasibility Studies

Over the past two years discussions have continued between NAVSHIPS and OPNAV concerning additional AORs, beyond those included in the FY 66 Program. During this time changes to the original baseline have been

proposed and counter proposed. Resultant evaluations to determine the cost/price impact of each proposed characteristic change had to be made. With characteristic uncertainty and insufficient time to develop accurate cost estimates, the problem of how to accurately forcast end cost becomes acute.

PMS 383 has provided a copy of the AOR-7 Ship Acquisition Plan and an AOR-7 Program Chronology, which contains copies of key correspondence to this acquisition program. From this information, project planning, progress to date, and individual problem areas can be studied further by NPS SAM students. The Project Manager and his leading staff members fully support the experience tour concept for SAM students, and have extended the invitation for students to be assigned to PMS 383 for their experience tours, should this concept be approved.

DESTROYER (DD-963/DDG) SHIP ACQUISITION PROJECT

Background Information:

The Destroyer (DD-963/DDG) Ship Acquisition Project was formally chartered by the Naval Ship Systems Command on 1 August 1969, and the Project Manager designated PMS 389.

The DD-963 (Spruance Class) Program was originally planned to provide fifty new ASW destroyers, with additional gunfire support mission capability. Thirty were eventually approved and a contract awarded to Litton Systems, Inc., Pascagoula, Mississippi on 23 June 1970.

There were several new concepts applied to this program. First, a multi-year contract was awarded to one shipbuilder for production of all thirty ships. Second, Navy established a baseline for the ship, and contractors specified in their proposals, the details of how the baseline would be met.

At that time, DOD Directive 4105.62 required that research and development contracts estimated at more than $25 million and production contracts estimated to cost more than $100 million be subjected to formal proposal evaluation and source selection procedures. Since this program cost was projected to exceed $2 billion, the provisions of this directive were applicable. The Secretary of Defense authorized the Secretary of the Navy to designate the Chief of Naval Material personally as the Source Selection Authority (SSA). The SSA appointed a Source Selection Advisory Council (SSAC), consisting of eight flag officers and two civilians. The Project Manager was designated as chairman of the Source Selection Evaluation Board (SSEB), which consisted of seven

captains, including the chairman, two commanders and six civilians. The position of the SSA and the membership of the SSAC and SSEB reflect the highest level of importance placed on this program's source selection decision making process.

Visit Summary:

Since NPS had already made contact with, and received information from, the PMS 389 staff in the past, the primary purpose of my visit was to determine if enough documentation would be available to enable our tracking program progress and to see if the office would support student experience tours in the future.

It was suggested that since the DD-963 Program did not follow the most recent DOD acquisition criteria, that following the program progress of another type ship, such as the PF, may be more beneficial. I concurred with this conclusion, in that an enormous amount of effort would be required to select and reproduce material from file which would be necessary to establish a proper documentation base to track program progress from past events, through the present and into the future.

PMS 389 is already participating with NPS in student projects. Two Operations Analysis Curriculum students are working on a study to determine repair and stocking alternatives for the gas turbine engines. The results of this study may also apply to the PF Program and others using the same type of gas turbines.

The DD-963 Project Office has proposed adoption of a new concept in the assignment of military personnel to commission the ships. This would utilize Fleet Introduction Teams (FIT), rather than the

conventional pre-commissioning details (nucleus crews) for each ship. A permanently assigned team of officers and enlisted personnel would perform most of the functions normally accomplished by the nucleus crew, and act as supervisors and instructors for the ships' commissioning crews prior, and subsequent to ship delivery.

This concept has been tried on a pilot basis with other ship types and is expected to save large amounts of personnel travel and support funds. The documentation provided by PMS 389 can be used for reference purposes, or further developed into a cost effectiveness or personnel staffing study.

NUCLEAR - POWERED AIRCRAFT CARRIER (CVAN) SHIP ACQUISITION PROJECT

Background Information:

The Nuclear-Powered Aircraft Carrier (CVAN) Ship Acquisition Project (PMS 392) was established 24 April 1968 to provide intensive management for CVAN ship acquisitions.

Within the attach carrier force level authorized by the Department of the Navy Five-Year Defense Program, the CVANs designated as the NIMITZ Class (CVAN 68 and 69) will replace the last of the HANCOCK Class, in the attack carrier inventory. A new Class of CVAN, now under concept formulation, is scheduled for future construction.

The project staff consists of five military officers and approximately twenty five civilian personnel. There is a military Project Manager (CAPT/1400), civilian Deputy Project Manager (GS 16), who is also designated Technical Director, and two Assistant Project Managers (CVAN 68/69; CVAN 71 CF/CD). The Project Manager has four assistants, namely Administrative Assistant, Assistant for Technical Management, Assistant for Programs and Logistics Manager, and Assistant for Air Systems. The remainder of the organization includes Programs (Plans and Financial), Ships Systems Management Division, Quality Assurance, Test and Trials Management Division, and the ILS Management Division.

Visit Summary:

During my visit to Newport News, Virginia, I met with and toured the NIMITZ construction site with the CVAN Project Officer. A summary of the meeting is covered in the section of this report entitled Supervisor of Shipbuilding, Conversion and Repair, Newport News.

After returning to Washington, I discussed my observations at Newport News with the CVAN Project Manager and his deputy. They stressed the importance of the role of the Project Officer at the construction site. Through this source, the project office can be informed of construction progress and advised of problems as they develop and are resolved. This relationship is vital in keeping the project staff in contact with events as they occur.

Both agreed with the need for using current case material in the NPS SAM Curriculum. However, one difficulty cited in gathering this material concerns that of presenting enough background information to set the stage for evaluating decisions made in the past. Many decisions or final outcomes of decisions are still pending in the form of negotiated change orders, contract modifications, claims, etc., which points out the high degree of importance placed by this project in the areas of procurement and contract administration.

The quantitative approach to decision making is considered an important aspect in the management of this project. Technique simplicity was emphasized, to assure that the results can be understood by both those conducting analyses, as well as those to whom the results are being addressed. One of the techniques mentioned was the Kepner-Tregoe approach. NAVSHIPS teaches this technique during a one-week course, as part of their management training program.

Cost control management is an area of concern to the project. With a single ship acquisition costing close to $1 billion, continued interest at the highest Navy, DOD and Congressional levels creates a high visibility environment for the Project Manager and his staff. Under

this type of atmosphere, cost information must continuously flow between the project office, construction site and supporting activities.

One specific problem that I was able to observe for myself while visiting Newport News, was the effect of changes to compartments or equipment configurations once the compartments involved have already been completed. Many of the spaces adjacent to the ship's bottom on NIMITZ have already been completed, even though the ship is still approximately two years away from delivery. Any changes required in these areas of the ship, in addition to costing considerably more, may well impact on the ship's building schedule. This again points out the necessity for the project staff to perpetuate an uninterrupted flow of information to and from the building site and having the on-site Project Officer as the focal point for this information.

Contact with the CVAN project will continue. Information concerning the contract has already been provided to NPS, which will be used in the SAM courses. The student experience tour concept is fully supported by PMS 392.

PATROL FRIGATE SHIP ACQUISITION PROJECT

Background Information:

In September 1970, the Chief of Naval Operations (CNO) initiated a series of feasibility studies to examine a new class or classes of ships to conduct antisubmarine warfare (ASW), antiaircraft warfare (AAW) and surface warfare. Equipments for these ships were to be relatively simple, the use of complex weapon and sensor systems was to be avoided, and rapid delivery of the ships to the fleet was essential.

After receiving the results of these studies in January 1971, CNO approved initiation of the Conceptual Phase to explore the Patrol Frigate (PF) mission and design assumptions in greater detail. The first part of this phase, which consisted of design studies conducted by the Naval Ship Engineering Center (NAVSEC), was completed in May 1971 and the second part, the design engineering for the ship system commenced in June.

Information for prospective offerers for the PF Ship System Design (SSD) Support and lead ship construction was forwarded to industry in October 1971, then on 8 November, an industry briefing was held by the Ship Acquisition Project Manager (SHAPM), NAVSHIPS PMS 399. /1 At this Presolicitation Conference, prospective offerers were briefed on program background, project organization and features of the current procurement.

/1 PMS 399 was chartered by NAVSHIPS on 1 August 1971

Preliminary design is scheduled for completion in December 1971 and the first technical baseline, the PF Functional Baseline (FBL) will be established.

The procurement plan specifies award of cost-plus-fixed-fee SSD support contracts to two shipbuilders by mid-March 1972 and a lead-ship production contract to one of them in April 1973. It is anticipated that contracts for follow ships will be awarded for the first block of 24 ships in February 1975 and a second block of 25 ships in June 1977, on a fixed price multi-year basis.

Visit Summary:

The PF is the Navy's newest large multi-year shipbuilding program. It will evolve from the present Conceptual Phase through production and introduction to the fleet under the latest Department of Defense acquisition criteria.

This offers many opportunities for NPS SAM students to participate as the program progresses. For example, during my visit I had the opportunity to attend the Presolicitation Conference. The industry representatives were given an overview of the entire program as it is now planned, and several concepts were introduced for the first time. The ship is being designed to meet a predetermined price ceiling, and two shipbuilders will be working with NAVSEC in finalizing detailed plans. Contractor A, who will be the one chosen to build the lead ship, will not automatically assume production of the first block of follow ships, but rather compete with other shipbuilders for the contract. Contractor B, who will be selected to assist in engineering development, along

with Contractor A, will not participate in the construction of the lead ship.

Aside from discussions with the project staff and attending the Presolicitation Conference itself, I was able to obtain copies of the information distributed to industry prior to the conference, and the Conference Summary distributed after the conference. This material, coupled with copies of the Patrol Escort Concept Exploration Report (July 71) and the Conceptual Phase Plans For Patrol Escort (Feb and Mar 71) will serve as an information baseline for NPS in following the progress of this program. Cases, individual reports and theses can be developed from this material, supplemented by further contact with the project staff.

It was determined during my visit that the PF SHAPM may have individual studies or analyses that NPS students can undertake for term projects. The concept of the assignment of SAM students to project offices for experience tours was supported.

COST ESTIMATING AND ANALYSIS IN NAVSHIPS

Background Information:

The Ship Cost Estimating Branch, SHIPS 0161, is responsible for performing ship acquisition cost estimating during the planning, programming, budgeting and appraisal process for all ship construction and conversion programs, and for performing ship "life cycle" cost estimating.

This includes the responsibility for preparing, or reviewing prior to release, all ship construction and conversion cost estimates going to activities outside NAVSHIPS, preparing cost estimates for budgeting, developing procedures for cost estimating which use both computer and parametric techniques, and a host of other functions pertaining to cost estimating.

There are approximately twenty six civilian personnel in the branch. No military personnel are assigned.

Visit Summary:

At the recommendation of the PMS 392 staff, I visited SHIPS 0161. Since the individual projects are not staffed with sufficient cost analysis expertise, this organization is involved with all of the project offices in NAVSHIPS. Because of the management attention and high visibility directed to cost control, it is indeed a vital link in the project management structure.

The two primary functions performed by this office are cost estimating and cost analysis. Cost estimating concerns the in-house development of cost estimates and cost analysis involves the review and validation

of cost estimates prepared by outside activities. Approximately one half of the staff is dedicated to each of these functions. Independent cost estimates are provided to the NAVSHIPS 02 contracts organization prior to bid openings.

No "should cost" studies for ship acquisitions have been conducted to date, however almost half of the project staff have already received "should cost" training at an Army sponsored course of instruction.

The Branch Head was interested in the SAM Curriculum and agreed to assist us in any way possible. Although no military are currently assigned to SHIPS 0161, he emphasized the importance of officers assigned to projects becoming aware of the services provided by the branch.

SUPERVISOR OF SHIPBUILDING, CONVERSION AND REPAIR, USN, NEWPORT NEWS

Background Information:

Supervisor of Shipbuilding, Conversion and Repair (SUPSHIP) USN, Newport News is located at the Newport News Shipbuilding and Drydock Company, a division of Tenneco Incorporated, Newport News, Virginia.

The responsibilities of this organization include the administration of Navy and other Department of Defense contracts for ship design, construction, conversion, outfitting, repair, alteration, inactivation and reactivation, planning, estimating and design functions for Navy ship work in the contractor's plant, review and approval of contractor's plans, providing technical and engineering assistance, administering Quality Assurance programs, and arranging and overseeing performance during trials.

The SUPSHIP organization is commanded by the Supervisor (RADM/1400) and consists of approximately thirty military and four hundred civilian personnel. It is structured on a matrix basis with Project Offices established for the various ship programs, and Assistants to the Supervisor for Weapons and Aviation Systems, Management Information Systems Officer and Product Assurance Engineering Office reporting directly to the Supervisor. The department structure of the organization includes Administrative, Planning, Quality Assurance, Contract, and Material Departments.

Visit Summary:

The primary purpose of my visit to Newport News was to attend the DLGN 36 Class Quarterly Production Progress Conference and to observe

SUPSHIP operations. Comments concerning the conference are included in the section of this report dealing with the AAW Ship Acquisition Project.

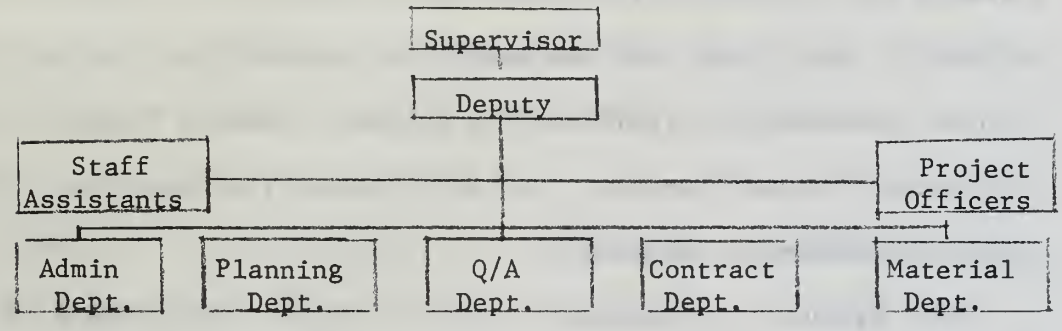
After discussions with the Contracting Officer and attending the conference, I toured the DLGN and CVAN construction sites and met with both the DLGN and CVAN Project Officers and their staffs.

The Contracting Officer was already familiar with the NPS SAM Program, and stressed the importance of officers being familiar with field contract administration procedures, in addition to the other phases of procurement. He also emphasized the necessity of developing an understanding and appreciation of the contractor viewpoint in approaching solutions to contract related problems.

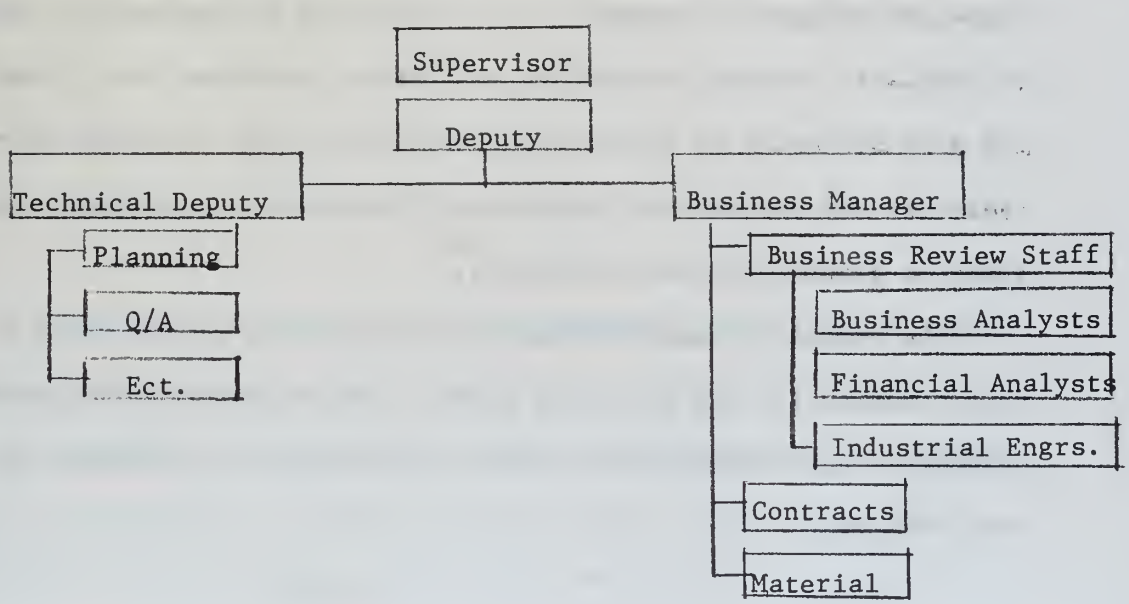
We discussed the need for "business competence" and "better business practices" which is now being emphasized at the highest levels of Congress, DOD and Navy. One of the proposed methods of upgrading our business posture is establishing Business Managers in the Project Offices and SUPSHIP organizations. There are several ways that a Business Manager can be established in a SUPSHIP and specific areas in which a business staff can apply their efforts. One approach is discussed below:

First, we should compare the present SUPSHIP organizational structure with a new format that might be used in establishing a Business Manager.

Present SUPSHIP Organization



* Alternative SUPSHIP Organization



* This format is not intended to represent the entire SUPSHIP organizational structure, but rather to present the relative organizational position of a Business Manager and his staff. This is only an alternative and is not intended to represent an officially recognized structure.

The primary purpose of a Business Review Staff would be that of providing a systems review of contractor activities, i.e. estimating, budgeting, financial control, cost accounting, material control and quality assurance

systems; and efficient utilization of resources, including manpower planning and allocation, facilities utilization, etc. Visibility would be given to many areas that now seem to be resolved only through claims, such as implementing a Profitability System to clearly identify the profit picture for each contract, and a Q/A System that would not rely solely on government inspection.

This approach to management could be highly controversial, in terms of contractor attitudes and funding to support the installation of these new management systems. If a contractor recognizes his inabilities to cope with costing, scheduling and control problems, etc., then working with him would be considerably easier than the situation where he feels his own systems are adequate and government requirements will only serve to disrupt his own operations.

The success of establishing the concept as a way of doing business with a contractor has yet to be proven. This subject should present meaningful opportunities for further exploration by a student (s) in the SAM Curriculum.

During my discussions with the Project Officers and their staffs, I asked which areas that were problems for them could be addressed in the SAM Curriculum. Their greatest concern was the interpretation of contract specifications and the resolve of problems associated with the interpretations. Two short problems were cited as example situations:

(1) Welding Specifications: The contractor was directed to use either ASME or ABS standards in performing a welding task.

Certification for this work was to be accomplished in accordance with the applicable MILSTD. The matrix below shows the dilemma that resulted, simply because the MILSTD did not specify the same procedures as either the ASME or ABS standard procedures.

Procedure	MILSTD Rqmts.	ASME Stds.	ABS Stds.
A	X		X
B	X	X	
C	X	X	X
D	X	X	
E		X	X
F			X

(2) Paint Specifications: The CVAN contract specifications called for application of a preservative metallic base coat, then painting to a prescribed thickness. The specifications called for the base coat to be applied in greater thickness than called for in the NAVSHIPS Technical Manual. When paint was applied to the surface over the base coat, it peeled within twenty-four hours. This was an example of the specifications not being current with the "state of the art" information contained in technical references. Had the specification not been so specific, the contractor would have done the job right in the first place.

A classroom exercise for studying this area could be developed by having students read a given set of specifications. The class could be

split into two groups, one interpreting the specs from a contractor viewpoint, and the other from the government viewpoint. Each group would develop their own interpretations separately, then meet with the other group, compare notes and resolve differences.

Training for both officer and civilian SUPSHIP personnel was a specific interest area expressed by one of the Project Officers. He felt that the three week Management Course for Engineering Duty Officers conducted at Norfolk by Harbridge House and the series of courses sponsored by the Naval Material Command Headquarters as part of their Contract Administration Improvement Project were very beneficial.

When asked their opinion as to the feasibility of having some of the SAM students having experience tours in a SUPSHIP organization, the Project Officers agreed that this would be an excellent educational experience. Both indicated that the students should have a basic knowledge of contracts and the provisions of the NAVSHIPS acquisition directives in advance of such tours, in order to relate their experiences during the tour to the proper way of doing business. This would also improve their ability to contribute to the organization they are assigned to. After discussions with these people and actually observing some of the same problem areas discussed while touring the DLGNs and CVANs, I am in complete agreement.

SURFACE MISSILE SYSTEMS (SMS) PROJECT

Background Information:

The Surface Missile Systems (SMS) Project (PMO 403) is chartered by the Naval Ordnance Systems Command (NAVORD). Prior to December 1969, the development of surface missile systems was the responsibility of the SMS Project Office (PM 3). On 18 December 1969, the project was redesignated as PMO 403 and on 1 July 1971 the latest charter was issued.

PMO 403 is responsible for the management of two major programs, namely the SMS Weapon Systems Program and the Ship Anti-Missile Integrated Defense (SAMID) Program. The Project Manager has been deligated special authority by the Chief of Naval Material to integrate, direct and/or coordinate the efforts of various Project Managers and Systems Commands for all SMS programs throughout the Naval Material Command and for the establishment of an integrated anti-ship missile defense system.

The SMS Program consists of TERRIER, TARTAR, and TALOS (3T) Weapon Systems, including their surveilance, weapon direction, fire control, and launching sub-systems, and the missiles. A STANDARD Missile Extended Range (ER) Weapon System has been developed to succeed the TERRIER HT Missile and the STANDARD Missile Medium Range (MR) to replace the Improved TARTAR Missile. The MK-26 Combined Guided Missile Launcher is designed to stow and launch a combined load of STANDARD MR, AEGIS and ASROC Missiles.

Other systems in the SMS family include Point Defense and the Advanced Surface Missile Weapon System (AEGIS). Point Defense includes three versions (Basis Point Defense, Improved Point Defense and Advance Point Defense). United States participation in the NATO SEASPARROW Project is integral with Improved Point Defense. AEGIS is being developed for installation on new ships in future years. The sub-system descriptions for these systems are similar to the 3 T sub-systems described above.

The SAMID Program is a special assignment for PMO 403 by CNM, and the management process is treated separately from the SMS Program. Sub-systems, such as SMS, radar, command and control, EW, etc., are integrated and coordinated through the SAMID Program. PMO 403 tasks the REWSON Systems Project (PM 7) directly for all SAMID ECM sub-system requirements that come under the purview of the PM 7 Project.

This complex combination of missile systems is managed by six Program Managers, who report to the SMS Project Manager. Each manager has his own program staff, which is tailored organizationally to fit the specific needs of the particular program. Program Managers are designated for the TERRIER, TARTAR, TALOS, AEGIS, Point Defense and SAMID Programs.

Visit Summary:

The SMS Project organization is unique, in that it has undergone two major changes since December 1969. The first was transition from a CNM designated project (PM 3) to a NAVORD project (PMO 403). At this time, the PM 3 staff in its entirety became the PMO 403 staff.

In may 1971, as part of the NAVORD reorganization, PMO 403 was reduced in size from three hundred seven military and civilian personnel to about eighty, which is the present personnel level. This resulted in a shift of support personnel from within the project to the NAVORD functional organization. A summary of the "before" and "after" reorganization staff tally is shown below:

Component	Before	After
PMO 403 Staff	14	11
Plans, Programs and Resources	39	6
ILS	24	1
TERRIER	13	5
TARTAR	19	7
TALOS	7	4
AEGIS	26	22
Point Defense	10	8
SAMID	16	16
Technical Codes	139	0
	307	80

NOTE: The above figures include both military and civilian staff. There are approximately nineteen officers assigned to the project at present. The Project Manager, Deputy Project Manager, Director of Plans, Programs and Resources, and five of the six Program Managers are Navy Captains.

This series of changes demonstrates an important aspect of project management. That is, as a project progresses through its life cycle,

the organizational and personnel requirements will change. Its whole orientation changes as it evolves from the Research and Development stage, through production and on to modernization. This change becomes more pronounced in a conglomerate project, where many systems in different stages of development are managed by the same project organization.

As these changes occur, the project staff must adapt to a new environment. For example, the Plans, Programs and Resources, and ILS staffs were reduced greatly and the technical codes eliminated entirely. The people were transferred to other NAVORD codes, who are now tasked with providing support to the SMS Programs. However, their services are now extended to other areas of effort other than SMS. This situation calls for a different management approach to assure that the work is done, where people are no longer under the direct control of the Project Manager.

The particular problem of diminishing personnel resources being distributed over a greater range of work effort is not peculiar to the SMS Project. It can be a problem in any project organization, and is cited here as an example.

I held discussions with the Deputy SMS Project Manager; Director of Plans, Programs and Resources; TERRIER Program Manager; TARTAR, Point Defense and AEGIS Deputy Program Managers, and senior staff members from these organizations. Of the programs being managed, AEGIS with its largest individual complement of personnel, is probably the most self sufficient organization.

AEGIS, which is now in the development phase, has a sophisticated management information system, which monitors program status from both the contractor and Navy viewpoints. The work breakdown structure (WBS) is covered by MILSTANDARD 881. The control system extends to work origin/organization, scheduling, cost, contractor performance, and technical performance measurement. Earned values, equating to programmed or budgeted costs can be compared with actual costs, which are charged by cost account.

Another aspect of sophistication in the management of this program deals with threat analysis and modeling. The AEGIS staff is a direct contributor, and maintains and updates the Threat Model Handbook. This is one area of endeavor that I did not find the other projects that I visited involved with directly. Enabling the project staff to track right along with the operational requirements for the systems, as changes occur, can give the Project Manager, in my opinion, a more positive control over the direction of his program.

TERRIER, being an operational system, has the smallest program staff and an entirely different management orientation. In this organization the primary emphasis is in the area of improving the existing systems over a long period of time. These systems are installed in almost forty active fleet combatant ships.

TARTAR, as part of the Interim Surface to Surface Missile (ISSM) program, encompasses numerous missile and launcher systems. Currently, forty-six combatant ships have missile systems under the cognizance of this program, with a potential add-on of fifty ships in the future.

After my visit, the STANDARD Missile 2 development responsibility was shifted from TARTAR to the AEGIS Program.

Both the TERRIER and TARTAR program staffs have a wide range of responsibilities with a minimal number of personnel. Referring back to the previous paragraphs concerning the reorganization, those people remaining with these program staffs now have a greater coordination and monitoring burden. This is representative of the trade-off decisions that have to be made by Project Managers and their seniors, in deciding how to best manage and staff the wide variety of different programs.

Point Defense systems now exist in three different verions: Basic Point Defense in the production phase; Improved Point Defense, as the U.S. portion of NATO SEASPARROW Program, is still in the development phase; and Advanced Point Defense will replace the SPARROW Missile at some future date. Point Defense systems are part of the ongoing Anti-Ship Missile Defense (ASMD) Program. NATO SEASPARROW is discussed in another section of this report.

The SMS Project and Program Managers cooperated to the fullest extent during my visit, both in making time available for discussion, and by providing documentation. They support the NPS programs and the experience tour concept. A NPS engineering student, for example, was engaged in thesis research at an RCA facility, in connection with the AEGIS program, at the time of my visit. It was regretted that sufficient time was not available to visit all of the SMS Program organizations.

NATO SEASPARROW PROJECT

Background Information:

The NATO SEASPARROW Project Office (NSPO) is chartered under a Memorandum of Understanding which pledges the participating governments (United States, Norway, Denmark, Italy, Netherlands, and Belgium) to the cooperative effort of developing and producing the surface ship self-defense system named NATO SEASPARROW Surface Missile System (NSSMS).

A NATO SEASPARROW Project Steering Committee (NSPSC), composed of one member from each of the participating governments, is responsible for the implementation of this cooperative effort, in accordance with the terms of the Memorandum of Understanding. The NSPSC members are responsible for the coordination required within their own respective countries.

The NSPO serves as the executive staff for the NSPSC, and is responsible for the development and acquisition of the weapons systems. Each participating government furnishes staff personnel for manning the project office. A Project Manager, designated by the United States as head of the NSPO, is responsible to the steering committee for the operation of the office.

Each member nation assumes part of the development and production responsibility for the weapons systems. A single U.S. prime development contractor was selected, and sub-contracts awarded to companies in the participating countries, on a predetermined percentage of share basis. A country's share is dependent upon it's contribution to

the total development costs and the number of units of the total system required.

Visit Summary:

NATO SEASPARROW is quite unique in comparison with out other Navy projects. The Project Manager and his staff manage the same scope of activities, and face for resolve the same problems as the normal project organizations. However, instead of being responsible through the normal Navy chain-of-command, they report to the NATO SEASPARROW Project Steering Committee. This arrangement requires a management team effort within the project organization itself, and an extraordinary coordination and liaison relationship with each member country's naval defense organizations. NSPO works closely with the NAVORD SMS Project Office, since the NSSMS is one of the family of surface missile defense systems.

NSPO is now in the process of developing recommendations concerning the feasibility of a multi-national support agreement to provide continuing logistic support for the systems after they have been produced and delivered to the respective countries. This study may result in the preparation of a proposal which would be acceptable to the participating countries, or establish that multi-national support would not be of mutual benefit.

The participating countries have been discussing the need for establishing a means of providing continuing support, including training, configuration management, repair and maintenance facilities, etc. This is the first time, however, that a multi-national logistic support concept will be considered. The objective is to develop, if possible, a means of accomodating these support requirements within the framework of

existing organizations, and not establishing a new organization to manage and operate the support program.

Naval Postgraduate School has been invited to participate in this study, by developing an independent evaluation of the feasibility of the multi-national support concept. Interested students will have the opportunity to become involved in a "real world" oprational problem, and possibly contribute to developing a new approach to project management. NPS has expressed an interest in this project, and liaison with the NATO SEASPARROW Project Office will continue, for this and other possible future student projects.

PHALANX / VULCAN CLOSE - IN WEAPON SYSTEM PROGRAM

Background Information:

The PHALANX/VULCAN Close-In Weapon System (CIWS) is managed by the CIWS Program Office (NAVORD 5515), which is part of the Systems Acquisition Directorate, Surface Weapon Systems Acquisition Sub-Group of the Naval Ordnance Systems Command. This office is an element of the functional organization, as compared with the NAVORD weapons systems project offices designated PMOs. A Program (vice Project) Manager heads the CIWS Program Office, and his assignment, as in the case of a PMO, is approved by the Commander, Naval Ordnance Systems Command.

Program History:

In early 1966, the Chief of Naval Operations requested the Bureau of Naval Weapons (now NAVORD) evaluate industry proposals for a new light-weight shipboard gun system, capable of destroying high-speed incoming targets. By November 1968, General Dynamics Pomona Division had formally proposed PHALANX as a close-in weapon system.

A Program Engineer was assigned to coordinate the CIWS program in March 1969, and the Proposed Technical Approach (PTA) was forwarded to the Chief of Naval Operations in April. The Advanced Development Contract was awarded to General Dynamics in August 1969, and a series of feasibility tests were commenced in February 1970.

The technical Development Plan (TDP) was submitted on 15 February 1970, and the Advanced Procurement Plan (APP) for CIWS was forwarded to the Naval Material Command on 30 September 1970.

A Program Manager for CIWS was assigned in May 1971, and designated ORD 5515. That same month the Engineering Development Contract was awarded to General Dynamics. On 2 July 1971, the Development Concept Paper (DCP) was distributed to the Joint Chiefs of Staff, Assistant Secretaries of Defense and Assistant Secretaries of the Navy for concurrence. A CIWS management review was held by the Director, Defense Research and Engineering on 27 July.

The draft Specific Operational Requirement (SOR) was distributed for review and comment on 5 August 1971. In early October, the Assistant Secretary of the Navy (R & D) was briefed on the reliability and maintainability aspects of the CIWS by the Program Manager.

Visit Summary:

During my project office visits, I spent the most time with the PHALANX/VULCAN Program. My interest in this program resulted from the following factors: (1) in comparison with most of the other projects, it was new, with the Program Manager having been assigned only six months before; (2) the program organization was compact, consisting of a PM (CDR/1100), Deputy Program Manager, one Program Engineer and one secretary; (3) the CIWS itself is designed to have universal shipboard application, therefore there would be a resulting interaction with most, if not all, NAVSHIPS Project Managers at some point in time: (4) and during the course of my Washington tour, several key milestone events would occur, which would affect the future of the program.

I was granted permission by the Program Manager to attend all meetings and briefings concerning CIWS, talk at any time to his staff

and other NAVORD components concerning any management aspect of the program, and review any documentation from the Program Office files which would be of potential value in meeting the needs of my trip or the SAM Curriculum. In short, I had complete access to all aspects of the program operation.

This program, consequently, was the high point of my Washington visit, in that I had the opportunity to experience the project environment in as close to a real working capacity as could be possible. I was also able to obtain a considerable amount of thesis material and other documentation for use by the SAM Curriculum. In turn, I prepared a Program Chronology for use by the Program Manager.

The following paragraphs will cover the key events that occurred during the course of my visit. Since I was simultaneously visiting other projects during this same period of time, I was not personally involved in all of the events.

On 12 October a budget hearing was conducted by DDR&E in the Pentagon. This was one of a series of budget sessions that involved most, if not all Project Managers, and the issue was justification of the Fiscal Year 1973 budget requirements. The hearing were hastily scheduled, and with little advance notification the Deputy Program Manager and OPNAV CIWS Program Sponsor prepared a presentation. Since a minimal amount of time was available for the presentation, the Program Sponsor gave a short management overview of program progress to date, then invited questions from the floor. A barrage of questions were forthcoming, and almost all were of a technical nature concerning capability and performance. The

Deputy PM answered these questions as they were raised, consequently the hearing was of short duration. I was surprised by two factors: (1) the attendees of the hearing were not introduced, therefore it was impossible to identify in all cases who was asking the questions, and (2) considering that this was a budget hearing, only a minimal number of questions concerning the budget submission were posed.

The Program Manager briefed representatives from the government of Israel and representatives from the Naval Ship Engineering Center (NAVSEC) concerning the CIWS Program, in two separate sessions on 15 October. These were but two in a series of briefings that are required to promulgate information to those who will be potential users of the system in the future, and those who will be involved with installing the units aboard ship.

A major milestone event was the CNO Executive Board (CEB) briefing held on 19 October. During this meeting the CNO and his leading advisors were briefed by the Program Manager as to the current status and production options available for the CIWS Program. From this meeting the decision to proceed with engineering development and continue specific planning for production of operational and proto-type units was made, and a projected Initial Operational Capability (IOC) date assigned. This was indeed a major event, since theoretically the decision could have just as easily been made to discontinue the program. Other programs have been stopped or deferred by the CEB in the past. The CNO personally chairs this meeting, and this in itself can account for a great deal of expectation by a Project Manager. COMNAVORD was the only

other representative from the NAVORD organization attending the meeting. The Deputy Program Manager and I were able to hear, but not see, what was happening from the projection room. Final results of this meeting were promulgated by letter on 22 October.

In early November, the Program Manager designated the CIWS Integrated Logistics Support (ILS) Management Team. Eight people from various functional codes were assigned the responsibility for completing the CIWS ILS planning and implementation. Since the Program Office does not have an ILS staff, an ILS Manager is assigned from ORD 04, and he and the other team members are designated in writing, to be responsible to the Program Manager for management of the ILS function.

Initial discussions with representatives of the Naval Ship Systems Command to discuss the initial planning aspects for installing the CIWS units aboard active fleet ships, were held on 4 November. Since funds could not be cited at that time, and the ships on which CIWS units were to be installed had not been assigned, NAVSHIPS was unable to commence formal planning efforts. The real accomplishment of this meeting was making those people who would be involved aware of the program requirements. Later that week, a meeting was held with the CVAN Project staff to discuss planning for CIWS aboard the new construction attack aircraft carriers.

On 9 November 1971, a management briefing, similar to the one presented to the CEB, was held for the Secretary of the Navy. This also was a significant milestone, for it could have resulted in a change in program direction.

An OPN budget review hearing was held by the OPNAV financial staff for the Anti Surface Missile Defense (ASMD) program, which includes the PHALANX/VULCAN system. During this meeting it was apparant that the recent CEB results influenced the budget trade-off decisions, in that funds were reduced from some of the individual programs to assure more funding availability for the highest priority programs.

Further events and observations concerning the PHALANX/VULCAN Program will be included in my forthcoming thesis concerning weapons system acquisition management. Liaison with the program office will continue.

S-3A PROJECT (PMA 244) AND E-2/C-2ATDS PROJECT (PMA 231)

My visit to both of these Naval Air Systems Comand Projects resulted from previous contact by the Naval Postgraduate School. Both Project Managers had scheduled visits to the school, to brief SAM students concerning their own experiences in project management.

Captain Fred H. Baughman, the S-3A Project Manager, developed two case studies concerning the Contract Definition phase of the S-3A. I had the opportunity to assist in the preparation for his visit, by developing a set of representative student questions that might be asked during his presentation and by reviewing the cases and making comment. Copies of the questions, Captain Baughman's replies and the cases were then forwarded to NPS prior to his visit.

Captain Thomas D. Quinn, the E-2/C-2/ATDS Project Manager, had developed a case concerning the EA-6B Project. He had previously served in the EA-6B Program as OPNAV Coordinator of Program Requirements for Airborne Electronic Warfare. This experience coupled with that of now being a PMA enables Captain Quinn to present the subject of project management from both the OPNAV and acquisition management viewpoints. My assist in this instance was limited to providing an advance student reaction to the case, prior to his presentation at the school. Copies were also provided prior to that presentation.

Both fully support the NPS SAM Curriculum and stress the need for a mixture of theory and reality in the academic program.

SYSTEMS COMMAND CONTRACTS DIRECTORATES

Background Information:

Each Systems Command has a Contracts Directorate (02), which is responsible for the planning, award and termination of contracts. Additional responsibilities include providing advice and assistance in contracting matters, developing and promulgating Command policies and monitoring contractual performance.

Contracting in NAVSHIPS is performed by three divisions: Shipbuilding and Repair Purchase, Electronics Purchase, and Machinery Purchase. NAVAIR also has three divisions: Airframe Purchase, Aircraft Components Purchase, and Weapons System Purchase. NAVORD contracting is distributed among four divisions: USW Systems Purchase, AAW Systems Purchase, Strategic Warfare Systems Purchase, and Surface Warfare Systems, Talos and Missile Development Purchase. These are the divisions that have an everyday working relationship with the various project organizations. The Contracts Directorates additonally have support divisions and staffs to perform the other aspects of their organizational missions.

Visit Summary:

I visited three Contracts Directorates: NAVAIR 02, NAVORD 02, and NAVSHIPS 02. Each confirmed the necessity of developing a more complete understanding, between the contracts and project personnel, of the importance of team effort in supporting the acquisition of large complex systems. Project personnel must understand the importance of following proper contracting practices and procedures, and on the other hand, contracts personnel must be responsive to the needs of the projects.

Cost analysis is viewed as a critical area. One prime example involves claims. Contractors have professional legal staffs to develop claims; then the government has the responsibility to review the data and develop counter proposals or deny the claims. Managers must have the ability to make the "crunch" decisions as to the validity and reasonableness of the claims. This ability is contingent upon cost analysis expertise.

Another point discussed is the time required for industry to develop proper proposals. In many instances, where there are delays in issuing the Requests for Proposal (RFPs), contractors are expected to bring the whole program back on schedule by taking less time to develop their proposals. To compensate, the contractors may submit "shotgun" estimates, which will always be higher in price. Another possible result is a less than acceptable proposal from the technical viewpoint. This relates to the previous paragraph dealing with the necessity of all concerned to know the rules and practices and then working together in a team effort to achieve the required results.

The contracting officials supported the need for the SAM Curriculum to work with current case material, as a means of involving students in finding solutions to present day problems, and agreed to assist in any way they could. They also concurred that experience tours would provide an additional element of realism to the curriculum, and greatly benefit the officers involved.

OTHER ORGANIZATIONS

Aside from those that have already been summarized, I visited other component organizations within OPNAV, NAVMAT, NAVSHIPS, NAVORD and the Bureau of Personnel.

The primary purpose of these visits was to update interested parties as to the status of the SAM Curriculum and solicit information that could be used in the SAM courses. Documentation such as organizational manuals, reports, instructions, etc. were provided, as well as materials that can be developed into case problems.

Contact with these organizations resulted from recommendations by either project office personnel or presentations at the NLMS Baseline Course. The areas discussed included latest policies under development, latest procedures being implemented, NAVMAT reorganization study, Integrated Logistic Support (ILS) concepts, PPBS cycle, etc.

An important observation that should be noted is that the problems of project (acquisition) management are being acted upon by all levels of the OPNAV and NAVMAT headquarters organizations. Guidance is available to help the projects arrive at conclusions/solutions to their problems, and in many cases this seems to be unrecognized.

All that I talked with reiterated the need for a continuing educational process, starting from an academic base and followed through by periodic updating while on the job. An important aspect of the "on the job" process is that of developing a closer working dialogue between the OPNAV (user) and NAVMAT (producer) communities.

During the week of 15 November, I assisted my faculty advisor during his visits to the Washington headquarters and project organizations. Again, our findings were of complete cooperation in supporting the SAM Curriculum at Naval Postgraduate School.

SUMMARY

After attending the NLMS Baseline Course, my original plan was to establish an orderly schedule for calling on the various project and functional organizations. This approach was found unworkable, in that my attendance at top level meetings, i.e. the CNO CEB presentation and NAVMAT Management Review, which were attended with the PHALANX/ VULCAN Program Manager, and NAVSHIPS PF Industry Briefing, and special meetings involving the Project/Program Managers, were scattered throughout the duration of my tour. Additionally, it was necessary to coordinate my visits to fit the schedules of individual Project Managers and their staffs. Consequently, in formating this report, I chose to refrain from relating to my actual schedule, and summarized by organization. Hopefully, this will assist in maintaining a degree of continuity in reporting the results of my visit.

In summarizing the individual organizations, I concentrated on developing areas that were of specific concern to individual staffs, and those areas, defined by personal observation, that would provide examples of problems applicable to other projects as well.

The most significant common denominator among the projects, is the incredible amount of change that must be faced, i.e. changes in requirements, priorities, scheduling, configuration, funding, timing, personnel, etc. Reaction to these changes and developing solutions to problems depend upon a number of factors, including: how project offices are organized and staffed, the urgency of the project as viewed by the

Systems Command level and above, and a variety of behavioral considerations. Each project organization is dedicated to a different task(s), with different requirements, and the result is that each Project Manager and staff has developed a particular management style to fit his specific needs.

Without exception, the NPS SAM Curriculum has universal support by those that I met in Washington. Every person that I talked with cooperated to the fullest extent, both in discussing project office operations, problems being encountered in the field of project management and by providing information and suggestions that will be of assistance in the curriculum. Considering coverage of approximately thirty different organizational components and contact with over one hundred people, I found this to be of great significance.

Assigning officer students to project organizations during the course of their NPS SAM program was viewed as a positive benefit to both the students and the organizations to which they would be assigned. There were, however, different opinions as to the length of the ideal experience tour. Most preferred a whole academic term, rather than a half term. A six week (1/2 term) tour would be too short in duration to provide a well rounded view of project operations and still enable the officers to actually participate in a working capacity to gain experience.

Another concept, which relates directly to the experience tour, is that of establishing a simulated project office environment at NPS, by assigning the students to actual project office roles and having

them manage the acquisition of a simulated weapons system, from the initial planning phase through the duration of the life-cycle. The Defense Systems Management School (DSMS), Fort Belvoir, is developing and using this educational technique at present, which is structured around a series of computer oriented exercises. Using this same technique, NPS could develop a program, whereby officers once having completed their experience tours, could return to NPS and apply the benefits of their recent experiences to the solution of problems in the simulated acquisition project.

One of the Project Managers interviewed, suggested that assigning officers to a given project and the supporting SUPSHIP or NAVPRO, would provide a project team that could relate to that single program from different points of view. He felt that trying to form project teams with officers that had their experience tours in a highly diversified group of project offices, may present significant difficulties.

CONCLUSIONS AND RECOMMENDATIONS

It can be concluded from my visit that the NPS SAM Curriculum is vitally needed, as a means of assuring that Navy is making progress in finding better ways to face the increasingly complex problems of managing the acquisition of large sophisticated weapons systems.

The establishment of experience tours as part of the curriculum, even at the expense of extending the program to seven or eight terms is felt to have a high payoff. By this means the students will receive that necessary exposure to and experience in the project management area, and provide a means by which the curriculum could be continuously up-dated as policy, procedural and operational changes occur. Currency must be assured to meet the stated objectives of the SAM Curriculum. If funding availability becomes a constraint, students could be selected to participate in experience tours on a competitive basis or other means of determination designed to limit the number of students.

Another method of assuring that the curriculum is kept current with the needs of the "real world" is by continuing the exchange of NPS faculty and persons qualified to teach from the Washington project organizations.

Especially considering the high degree of interest in the NPS program expressed by those contacted in Washington, every means of keeping abreast of events as they are occurring is necessary. Student and faculty experience tours, and presentations at NPS by project staff personnel and Project Managers are all means of accomplishing this objective.

It is hoped that this report has provided an adequate overview of project operations, problems being experienced by the projects and supporting functional organizations, and some recommendations as to how we can improve our Systems Acquisition Management Curriculum at Naval Postgraduate School. Time prevented further exploration in many of the areas, and this is regretted; however with the contacts that have been made, with their readiness to assist, it is assured that we have made progress.

APPENDIX A

NAVY LOGISTICS MANAGEMENT SCHOOL

NAVAL STATION

WASHINGTON, D.C. 20390

WEASON SYSTEM ACQUISITON MANAGEMENT BASELINE

COURSE

TRIM #6400 XXX 7100 — 27 September - 8 October 1971

COMMAND/RANK/NAME	TITLE	CODE
OPNAV		
CDR Carl. W. Addison	Carrier Warfare - ASW	551E
CDR Melvin R. Lee	ASW Ordinance	411
LCDR James A. MaGee	Asst. Air ASW Branch	981E11
CAPT John G. Now	Hd., Amphibious Warfare Desk	323
CDR David C. Shepherd	Asst. Head CVAN Program Coordinator	05W5B
CAPT Martin J. Twite, Jr.	————	506E
LTCOL (sel) Bobby R. Wilkinson	Unguided Air to Surface Weapons	506F5
PM-1		
CAPT J. A. Fitzpatrick	Plans & Programs Branch	SP-11
CDR John A. Eshman	Ship Design & Installation Branch, Head	SP-26
PM-16		
CDR William G. Michael	Fleet Satellite Communication Project	PM-16-11
NAVELEX		
CAPT Raymond A. Pettigrew	Project Manager	PME-121
NAVORD		
CAPT Alfred M. Pride	Deputy Dir., Surface Weapons Sys. Acq. Sub-Group	55A
CAPT James F. Rex	Director, ASW Programs Integration	ASW-11
CAPT Deming W. Smith	Director, Program Eval. Off.	ASW-13

NAVSHIPS

John R. Kling	Deputy Project Manager	PMS-392
CAPT Edward W. Molzan	Project Manager	PMS-383
CAPT Robert K. Reed	Project Manager Sub. Acquisition	PMS-381
CAPT David L. Soracco	Deputy Director, Deep Sub. Sys. Project	PMS-395

OTHER

CDR (sel) Wilbert J. Nace	Student (U.S. Naval Postgraduate School, Monterey, Ca.)	———

APPENDIX B

PERSONNEL CONTACTS

Navy Logistics Management School

CAPT M. J. Franger, Mr. H. V. Pelton, Mr. E. L. Sutton, Jr.

Anti-Air Warfare Ship Acquisiton Project

CAPT J. T. Burrill (PMS 378), Mr. W. J. Fitzpatrick (PMS 378B), Mr. N. E. Plotner (PMS 378A1), LCDR J. West & Mr. J. Marks (PMS 3783)

Anti-Submarine Warfare Ship Acquisition Project

Mr. P. A. Batten (PMS 380A4)

Auxiliary and Amphibious Ship Acquisition Project

CAPT E. A. Molzan (PMS 383), LT R. E. Hoffler (PMS 383H), Mr. C. Becker (PMS 383A2), Mr. D. W. Kelly (PMS 383A3), LCDR J. M. Bell (PMS 383G), Mr. P. L. Barksdale (PMS 383-12)

Destroyer Ship Acquisition Project

CDR T. A. Biddison (PMS 3893)

Nuclear-Powered Aircraft Carrier Ship Acquisition Project

CAPT R. J. Eustace (PMS 392), Mr. J. R. Kling (PMS 392B)

Patrol Frigate Ship Acquisition Project

CAPT E. J. Otth (PMS 399), LCDR J. Quartana

Cost Estimating and Analysis Branch, NAVSHIPS

Mr. G. H. Main (SHIPS 0161)

SUPSHIP, Newport News

CAPT J. D. Evans (101), CDR W. E. Lowery (153), LCDR P. Sipple (154) Mr. S. A. Smith (154), CDR D. W. Potter (400)

Surface Missile Systems Project

CAPT E. A. Christofferson (PMO 403A), Mr. W. G. Dressel (PMO 403D), CAPT (Sel) J. R. Rapkin (PMO 403-01), CDR E. E. Goodwin (PMO 403-01C), Mr. M. H. Meekins (PMO 403-01A), CDR J. Roan (PMO 403-10), Mr. R. L. Mallonee (PMO 403-10A), Mr. H. C. Fronc (PMO 403-20A), Mr. W. J. Dichtel (PMO 403-40A), Mr. S. F. Huthinson (PMO 403-41), Mr. D. P. Pulvirenti (PMO 403-50A)

NATO SEASPARROW Project

CAPT T. M. Ward (NATO-00)

Phalanx/Vulcan Close-In Weapon System Program

CDR J. E. Paulk (ORD 5515), Mr. E. H. Gerlach, Mr. B. H. Tabb

S-3A Project

CAPT F. H. Baughman (PMA 244)
LCDR B. A. Wilcox (PMA 2443)

E-2/C-2/ATDS Project

CAPT T. D. Quinn (PMA 231)

Systems Commands Contracts Directorates

RADM K. L. Woodfin (NSHP 02), CAPT W. M. Emery (NSHP 02C), CAPT L. O. Larson (NORD 02), CDR J. E. McGee (NAIR 215A)

Naval Material Command Headquarters

VADM G. E. Moore II (NMAT 09), CAPT R. B. Cordray (NMAT 011), RADM R. G. Freeman III (NMAT 02), LCDR P. DeMayo (NMAT 0202), CDR R. L. O'Neil (NMAT 0213), CDR R. Youmans (NMAT 021D), Mr. C. McCarthy (NMAT 0421), Mr. W. A. Doyle (NMAT 051)

Office of the Chief of Naval Operations

Dr. O. R. Burns (NOP 098T), COL D. C. Stanton (NOP 982-F2), LCDR R. R. Rumney (NOP 980-E43), LCDR P. S. Frommer (NOP 980-E40) CAPT R. E. Adams (NOP 980E)

Bureau of Naval Personnel

CAPT W. W. Coons (PERS Ae), CAPT R. M. Weidman, Jr. (PERS Ag), CAPT L. F. Hicks (PERS Ag), LCDR R. W. Hunter (PERS Balb), CDR W. F. Grimm (PERS 1308), CDR W. H. Mayer (PERS B1501), CDR R. W. Foster (PERS A491)

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